

## CLAIMS

1. A two part mold for forming wafer scale caps, the mold comprising:  
a first half and a second half;  
the first half and second half, when brought together defining mold cavities for wafer  
scale caps;  
the caps having central areas surrounded by sidewalls, the side walls having free  
edges.
2. The mold of claim 1, wherein:  
the mold is made from a semiconductor.
3. The mold of claim 1, wherein:  
the caps are intended for attachment to a wafer and the mold is made from the same  
material as the wafer.
4. The mold of claim 3, wherein:  
the material is silicon and the caps are thermoplastic.
5. The mold of claim 3, wherein:  
the mold cavities have a spacing which corresponds to a spacing of the wafer.
6. The mold of claim 1, wherein:  
the mold cavities are formed using cryogenic deep silicon etching techniques.
7. The mold of claim 1, wherein:  
the first half of the mold has a lower surface in which recesses are formed;  
the second mold half having an upper surface in which grooves are formed;  
the recesses and grooves defining the cavities for the caps.
8. The mold of claim 7, wherein:  
the first half includes first holes formed through it;  
the holes located in registry with the recesses;

there being provided a first half release wafer from which project pins;  
the pins located in registry with the first holes;  
the first half having a thickness in the area of the first holes, the pins being longer  
than the thickness;  
5 the first half release wafer having a first position in which the pins are flush with an  
interior end of the first holes;  
there being a gap between the first half and the first half release wafer when the first  
half release wafer is in the first position.

10 9. The mold of claim 7, wherein:  
the second half includes second holes formed through it;  
there being provided a second half release wafer from which project pins;  
the pins located in registry with the second holes;  
the second half having a thickness in the area of the second holes, the pins being  
15 longer than the thickness;  
the second half release wafer having a first position in which the pins are flush with  
an interior end of the second holes;  
there being a second gap between the second half and the second half release wafer  
when the second half release wafer is in the first position.

20 10. The mold of claim 9, wherein:  
the second holes are located in registry with the grooves.

11. The mold of claim 1, wherein:  
25 the first and second halves are comprised of a semiconductor that is transparent to  
infrared light of a wavelength of about 1000 -5000 nm.

30 12. The mold of claim 8, wherein:  
the first and second halves and the first half release wafer are comprised of a  
semiconductor that is substantially transparent to infrared light of a wavelength of  
about 1000 -5000 nm.

13. The mold of claim 7, wherein:

the first half includes first holes formed through it;

the holes located in registry with the recesses;

5 there being provided a first half release wafer from which project pins;

the pins located in registry with the first holes;

the first half having a thickness in the area of the first holes, the pins being longer than the thickness;

10 the first half release wafer having a first position in which the pins are flush with an interior end of the first holes;

there being a gap between the first half and the first half release wafer when the first half release wafer is in the first position; and

the second half includes second holes formed through it;

there being provided a second half release wafer from which project pins;

15 the pins located in registry with the second holes;

the second half having a thickness in the area of the second holes, the pins being longer than the thickness;

the second half release wafer having a first position in which the pins are flush with an interior end of the second holes;

20 there being a second gap between the second half and the second half release wafer when the second half release wafer is in the first position.

14. The mold of claim 13, wherein:

25 the first and second halves and the first and second half release wafers are comprised of a semiconductor that is transparent to infrared light of a wavelength of about 1000 -5000 nm.

30 15. The mold of claim 1, wherein:

the first half has first portions which separate adjacent areas;

the second half has second portions which separate adjacent grooves;

the first and second portions coming together when the halves are brought together such that material is squeezed out from between the first and second portions, separating adjacent caps.

- 5      16. The mold of claim 1, wherein:  
the first half has first portions which separate adjacent areas;  
the second half has second portions which separate adjacent grooves;  
the first and second portions coming together when the halves are brought together  
such that material is left as a thin layer between the first and second portions, the caps  
10 thus being formed as an array joined by the thin layer.
17. The mold of claim 15, wherein:  
the first and second portions are formed by electron beam or X-ray lithography.
- 15      18. The mold of claim 2, wherein:  
the first half has first portions which separate adjacent areas;  
the second half has second portions which separate adjacent grooves;  
the first and second portions coming together when the halves are brought together  
such that material is squeezed out from between the first and second portions,  
20 separating adjacent caps.
19. The mold of claim 2, wherein:  
the first half has first portions which separate adjacent areas;  
the second half has second portions which separate adjacent grooves;  
25 the first and second portions coming together when the halves are brought together  
such that material is left as a thin layer between the first and second portions, the caps  
thus being formed as an array joined by the thin layer.
- 30      20. The mold of claim 2, wherein:  
the first half of the mold has a lower surface in which recesses are formed;  
the second mold half having an upper surface in which grooves are formed;  
the recesses and grooves defining the cavities for the caps.